This listing of claims will replace all prior versions, and listings, of claims in the

application:

LISTING OF CLAIMS:

1. Canceled.

2. (Previously Presented)   The apparatus of claim 45, wherein a density of said at least one
nearby device over a coverage area for the ad-hoc communications network is high.

3. (Previously Presented)   The apparatus of claim 45, wherein the distributed information
includes at least one information record, each information record including at least one of device
information or application information.

4. (Previously Presented)   The apparatus of claim 45, wherein the device information includes
state information, an address, a friendly name, a hop count, a sequence number, a time value, and a
time counter.

5. (Previously Presented)   The apparatus of claim 45, wherein the application information
includes an application identifier, capability information, version information, state information, an
address, a hop count, a sequence number, a time value, and a time counter.

6. (Previously Presented)   The apparatus of claim 45 wherein when the device includes the
middleware layer, the processor is further configured to:
        store the disclosed information in a portion of the memory device,
        wherein the portion includes at least one record.

7. (Previously Presented)   The apparatus of claim 45, wherein when the portion of the memory
device is full, to store the disclosed information, the processor is further configured to:
        identify an oldest record of said at least one record; and
        overwrite the oldest record with a new information record from said at least one information
record.

8. (Previously Presented)   The apparatus of claim 45, wherein when the portion of the memory device is full, to store the disclosed information, the processor is further configured to:

    identify an old record of said at least one record;

    identify a new information record from said at least one information record, the new information record being a replacement for the old record; and

    overwrite the old record with the new information record.

9. (Previously Presented)   The apparatus of claim 45, wherein a portion of the memory device includes exchanged information that identifies at least one application or service that said at least one nearby device supports.

10. (Previously Presented)   The apparatus of claim 45, wherein when receiving an inquiry request from one of said at least one nearby device, the processor is further configured to:

    distribute the exchanged information as part of a service discovery response.

11. (Previously Presented)   The apparatus of claim 45, wherein when the device includes the middleware layer, the processor is further configured to:

    establish a link connection to one of said at least one target device; and

    access the requested service.

12. Canceled.

13. (Previously Presented)   The method of claim 46, wherein a density of said at least one nearby device over a coverage area for the ad-hoc communications network is high.

14. (Previously Presented)   The method of claim 46, wherein the distributed information includes at least one information record, each information record including at least one of device information or application information.

15. (Previously Presented)   The method of claim 46, wherein the device information includes state information, an address, a friendly name, a hop count, a sequence number, a time value, and a

time counter.

16. (Previously Presented)   The method of claim 46, wherein the application information includes an application identifier, capability information, version information, state information, an address, a hop count, a sequence number, a time value, and a time counter.

17. (Previously Presented)   The method of claim 46, wherein when the device includes the middleware layer, the method further comprises:

    storing the disclosed information in a portion of the memory device,

    wherein the portion includes at least one record.

18. (Previously Presented)   The method of claim 46, wherein when the portion of the memory device is full, the storing of the disclosed information further comprises:

    identifying an oldest record of said at least one record; and

    overwriting the oldest record with a new information record from said at least one information record.

19. (Previously Presented)   The method of claim 46, wherein when the portion of the memory device is full, the storing of the disclosed information further comprises:

    identifying an old record of said at least one record;

    identifying a new information record from said at least one information record, the new information record being a replacement for the old record; and

    overwriting the old record with the new information record.

20. (Previously Presented)   The method of claim 46, wherein a portion of the memory device includes exchanged information that identifies at least one application or service that said at least one nearby device supports.

21. (Previously Presented)   The method of claim 46, wherein when receiving an inquiry request from one of said at least one nearby device, the method further comprises:

    distributing the exchanged information as part of a service discovery response.

22. (Previously Presented)   The method of claim 46, wherein when the device includes the middleware layer, the method further comprises:

      establishing a link connection to one of said at least one target device; and

      accessing the requested service.

23. Canceled.

24. (Previously Presented)   The computer program product of claim 47, wherein the distributed information includes at least one information record, each information record including at least one of device information or application information.

25. (Currently Amended)   The computer program product of claim 47, the computer readable medium further storing:

      program code for storing ~~the~~ disclosed information in a portion of ~~the~~ a̲ memory device, wherein the portion includes at least one record.

26. (Currently Amended)   The computer program product of claim 47, wherein the program code for storing ~~the~~ disclosed information further comprises:

      program code for identifying an oldest record of said at least one record; and

      program code for overwriting the oldest record with a new information record from said at least one information record.

27. (Currently Amended)   The computer program product of claim 47, wherein the program code for storing ~~the~~ disclosed information further comprises:

      program code for identifying an old record of said at least one record;

      program code for identifying a new information record from said at least one information record, the new information record being a replacement for the old record; and

      program code for overwriting the old record with the new information record.

28. (Currently Amended)   The computer program product of claim 47, wherein a portion of ~~the~~ a̲ memory device includes exchanged information that identifies at least one application or service

that said at least one nearby device supports.

29. (Previously Presented)   The computer program product of claim 47, wherein when receiving an inquiry request from one of said at least one nearby device, the computer readable medium further stores:

      program code for distributing the exchanged information as part of a service discovery response.

30. (Previously Presented)   The computer program product of claim 47, the computer readable medium further storing:

      program code for establishing a link connection to one of said at least one target device; and

      program code for accessing the requested service.

31. Canceled.

32. (Previously Presented)   The apparatus of claim 48, wherein the processor is further configured to:

      establish a link connection with said at least one nearby device if the distributed database includes an association between said at least one nearby device and the required service.

33. (Previously Presented)   The apparatus of claim 48, wherein the distributed database includes at least one reference to the required service and an association between said at least one reference and one of said at least one target device.

34. (Previously Presented)   The apparatus of claim 48, wherein the processor is further configured to:

      decline a link connection with said at least one nearby device if the distributed database indicates that said at least one nearby device does not include the required service.

35. Canceled.

36. (Previously Presented)   The method of claim 49, further comprising:

establishing a link connection with said at least one nearby device if the distributed database includes an association between said at least one nearby device and the required service.

37. (Previously Presented)   The method of claim 49, wherein the distributed database includes at least one reference to the required service and an association between said at least one reference and one of said at least one target device.

38. (Previously Presented)   The method of claim 49, further comprising:

declining a link connection with said at least one nearby device if the distributed database indicates that said at least one nearby device does not include the required service.

39. Canceled.

40. (Previously Presented)   The computer program product of claim 50, the computer readable medium further storing:

program code for establishing a link connection with said at least one nearby device if the distributed database includes an association between said at least one nearby device and the required service.

41. (Previously Presented)   The computer program product of claim 50, the computer readable medium further storing:

program code for declining a link connection with said at least one nearby device if the distributed database indicates that said at least one nearby device does not include the required service.

42. Canceled.

43. (Previously Presented)   The apparatus of claim 51, further comprising:

means for establishing a link connection with said at least one nearby device if the distributed database includes an association between said at least one nearby device and the required

service.

44. (Previously Presented)   The apparatus of claim 51, further comprising:

means for declining a link connection with said at least one nearby device if the distributed database indicates that said at least one nearby device does not include the required service.

45. (Previously Presented)   An apparatus, comprising:

a memory device; and

a processor disposed in communication with the memory device, the processor configured to:

conduct an inquiry to discover at least one nearby device in an ad-hoc network providing an inquiry response including bit codes;

determine whether any of the inquiry response received includes modified bit codes as an indication that said at least one nearby device includes a middleware layer, said middleware layer comprising a middleware software for providing application and service discovery;

in response to determining that a received inquiry response does not include the indication that said at least one nearby device includes the middleware layer, disregard the inquiry response;

in response to determining receiving-that a received inquiry response includes the indication that said at least one nearby device includes a middleware layer,

create a wireless short-range connection to said at least one nearby device; and

initiate wireless message exchange with said at least one nearby device to conduct middleware-based application and service information exchange for determining whether at least one target device supporting a required application or service is accessible in the ad-hoc network, the application and service information including distributed information;

wherein the distributed information comprises information exchanged and circulated amongst devices in the ad-hoc network.

46. (Previously Presented)   A method, comprising:

conducting an inquiry to discover at least one nearby device in an ad-hoc network providing an inquiry response including bit codes,

determining whether any of the inquiry responses received includes modified bit codes as an indication that said at least one nearby device includes a middleware layer, said middleware layer comprising a middleware software for providing application and service discovery;

in response to determining that a received inquiry response does not include the indication that said at least one nearby device includes the middleware layer, disregarding the inquiry response;

in response to determining that a received inquiry response includes the indication that said at least one nearby device includes a middleware layer,

creating a wireless short-range connection to said at least one nearby device; and

initiating wireless message exchange with said at least one nearby device to conduct middleware-based application and service information exchange for determining whether at least one target device supporting a required application or service is accessible in the ad-hoc network, the required application and service information including distributed information;

wherein the distributed information includes (i) at least one reference to a required service, (ii) an association between each reference and one of said at least one target device, and (iii) state information about said at least one target device.

47.   (Currently Amended) A computer program product <u>comprising a computer readable medium storing program code</u>, executable in a computer system, <u>said program code comprising:</u>

~~a computer readable medium comprising:~~

program code for conducting an inquiry to discover at least one nearby device in an ad-hoc network providing an inquiry response including bit codes;

program code for determining whether any of the inquiry responses received includes modified bit codes as an indication that said at least one nearby device includes a

middleware layer, said middleware layer comprising a middleware software for providing application and service discovery;

program code in response to determining that a received inquiry response does not include the indication that said at least one nearby device includes the middleware layer, disregarding the inquiry response;

program code for creating a wireless short-range connection to said at least one nearby device; in response to determining that a received inquiry response includes the indication that said at least one nearby device includes a middleware layer, and

program code for initiating wireless message exchange with said at least one nearby device to conduct middleware-based application and service information exchange for determining whether at least one target device supporting the required application or service is accessible in the ad-hoc network, the application and service information including distributed information;

wherein the distributed information includes (i) at least one reference to a required service, (ii) an association between each reference and one of said at least one target device, and (iii) state information about said at least one target device.

48.   (Previously Presented)   An apparatus, comprising:

a memory device; and

a processor disposed in communication with the memory device, the processor configured to:

maintain a distributed database to associate each at least one service to at least one device in an ad hoc network;

conduct an inquiry to discover at least one nearby device in the ad-hoc network providing an inquiry response including bit codes;

determine whether any of the inquiry responses received includes modified bit codes as an indication that said at least one nearby device includes a middleware layer, said middleware layer comprising a middleware software for providing application and service discovery;

access the distributed database to determine whether said at least one nearby device includes a required service

in response to determining that a received inquiry response does not include the indication that said at least one nearby device includes the middleware layer, disregard the inquiry response;

in response to determining that a received inquiry includes the indication that said at least one nearby device includes a middleware layer, create a wireless short-range connection to said at least one nearby device; and

initiate wireless message exchange with said at least one nearby device to conduct middleware-based application and service information exchange for determining whether at least one target device supporting the required application or service is accessible in the ad-hoc network, the application and service information including distributed information;

wherein the distributed information comprises information exchanged amongst devices in the ad-hoc network.

49.   (Previously Presented)   A method, comprising:

maintaining a distributed database to associate at least one service to at least one device in an ad hoc network;

conducting an inquiry to discover at least one nearby device in the ad-hoc network providing an inquiry response including bit codes;

determining whether any of the inquiry responses received includes modified bit codes as an indication that said at least one nearby device includes a middleware layer, said middleware layer comprising a middleware software for providing application and service discovery;

in response to determining that a received inquiry response does not include the indication that said at least one nearby device includes the middleware layer, disregarding the inquiry response;

accessing the distributed database to determine whether said at least one nearby device includes the required service in response to determining that a received inquiry response includes the indication that said at least one nearby device includes a middleware layer,

creating a wireless short-range connection to said at least one nearby device; and

initiating wireless message exchange with said at least one nearby device to

conduct middleware-based application and service information exchange for

determining whether at least one target device supporting a required application or

service is accessible in the ad-hoc network, the required application and service

information including distributed information;

wherein the distributed information includes (i) at least one reference to a

required service, (ii) an association between each reference and one of said at least one

target device, and (iii) state information about said at least one target device.

50.   (Currently Amended) A computer program product <u>comprising a computer readable</u>
<u>medium storing program code</u>, executable in a computer system, <u>said program code comprising:</u>

~~a computer readable medium comprising:~~

program code for maintaining a distributed database to associate at least one

service to at least one device in an ad hoc network;

program code for conducting an inquiry to discover at least one nearby device

in the ad-hoc network providing an inquiry response including bit codes;

program code for determining whether any of the inquiry responses received

includes modified bit codes as an indication that said at least one nearby device includes a

middleware layer, said middleware layer comprising a middleware software for providing

application and service discovery;

program code in response to determining that a received inquiry response does not

include the indication that said at least one nearby device includes the middleware layer,

disregarding the inquiry response;

program code for creating a wireless short-range connection to said at least one

nearby device in response to determining that a received inquiry response includes the

indication that said at least one nearby device includes a middleware layer;

program code for initiating wireless message exchange with said at least

one nearby device to conduct middleware-based application and service information

exchange; and

program code for accessing the distributed database to determine whether

at least one target device supporting a required application or service is accessible in

the ad-hoc network, the application and service information including distributed information;

        wherein the distributed information includes (i) at least one reference to a required service, (ii) an association between each reference and one of said at least one target device, and (iii) state information about said at least one target device.

51.   (Previously Presented)   An apparatus, comprising:

        a memory device;

        a processor disposed in communication with the memory device;

        means for maintaining a distributed database to associate each at least one required service to at least one nearby device in an ad hoc network;

        means for conducting an inquiry to discover at least one nearby device in the ad-hoc network providing an inquiry response including bit codes;

        means for determining whether any of the inquiry responses received includes modified bit codes as an indication that said at least one nearby device includes a middleware layer, said middleware layer comprising a middleware software for providing application and service discovery;

        in response to determining that a received inquiry response does not include the indication that said at least one nearby device includes the middleware layer, means for disregarding the inquiry response;

        means for creating a wireless short-range connection to said at least one nearby device in response to determining that a received inquiry response includes the indication that said at least one nearby device includes a middleware layer; and

        when said at least one nearby device includes the middleware layer:

means for initiating wireless message exchange with said at least one nearby device to conduct middleware-based application and service information exchange for determining whether at least one target device supporting a required application or service is accessible in the ad-hoc network, the application and service information including distributed information;

wherein the distributed information comprises information exchanged amongst devices in the ad-hoc network.